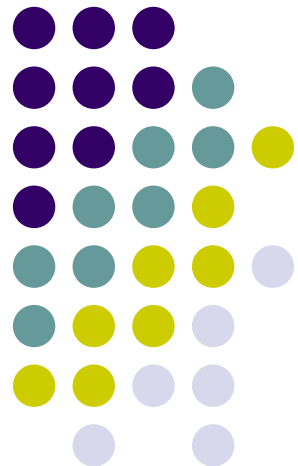
15.351 Managing Innovation and Entrepreneurship
Spring 2008

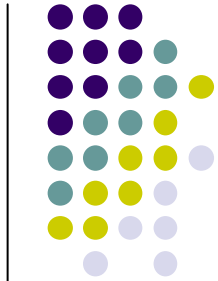
15. 351 Managing Innovation & Entrepreneurship

Fiona Murray
MIT Sloan School of Management
Spring 2008

Market Dynamics & Competitive Implications



AGENDA

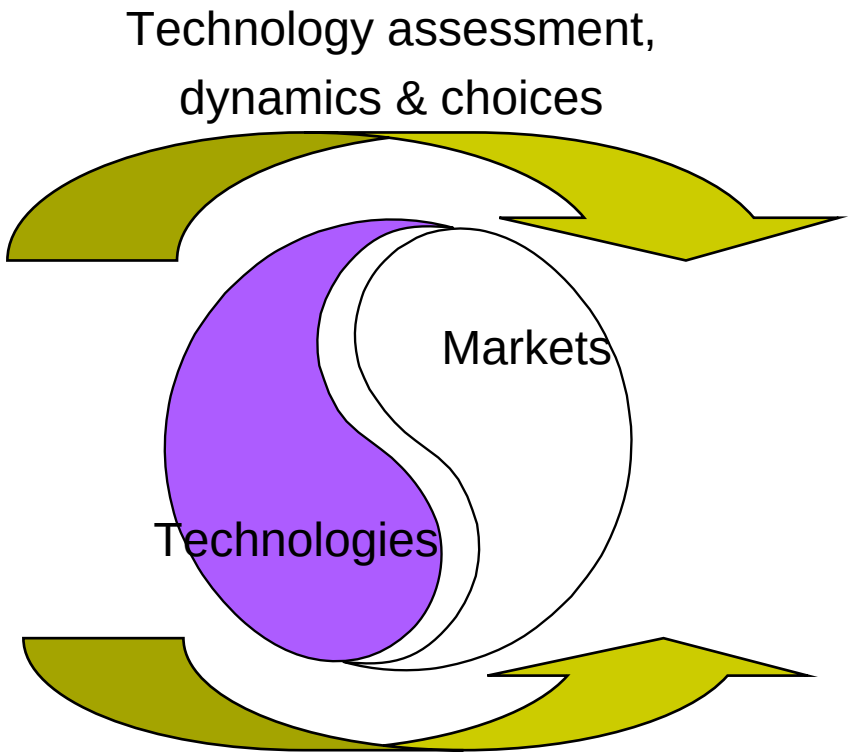


- Motivation for today's material: Why it is important to assess market-driven dynamics & why it is hard.

- Market S-Curves
  - Defining market dynamics
  - Mapping market dynamics
  - Managing market dynamics

- Competition – interaction of market & technology dynamics

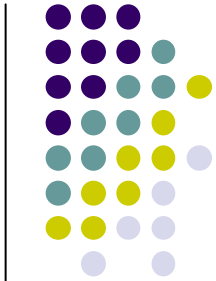
Typical analyses fail to examine the *dynamics* of technology & market factors



A more robust opportunity assessment is clear about the ***dynamics*** of the proposed technology & that of competitors & the proposed market & that of competitors

THIS IS HARD – WHY?

Can we forecast the dynamics of market change?



- Hard because:
  - Predicting the future
  - Hard to get data
  - Requires expert knowledge (across domains)
  - Blind spots when considering others' response

But….

- Wealth of historical data
- Customers to talk to
- Robust heuristics – market S curve

Harder or easier than technical change?

Consider the case of hybrid corn...

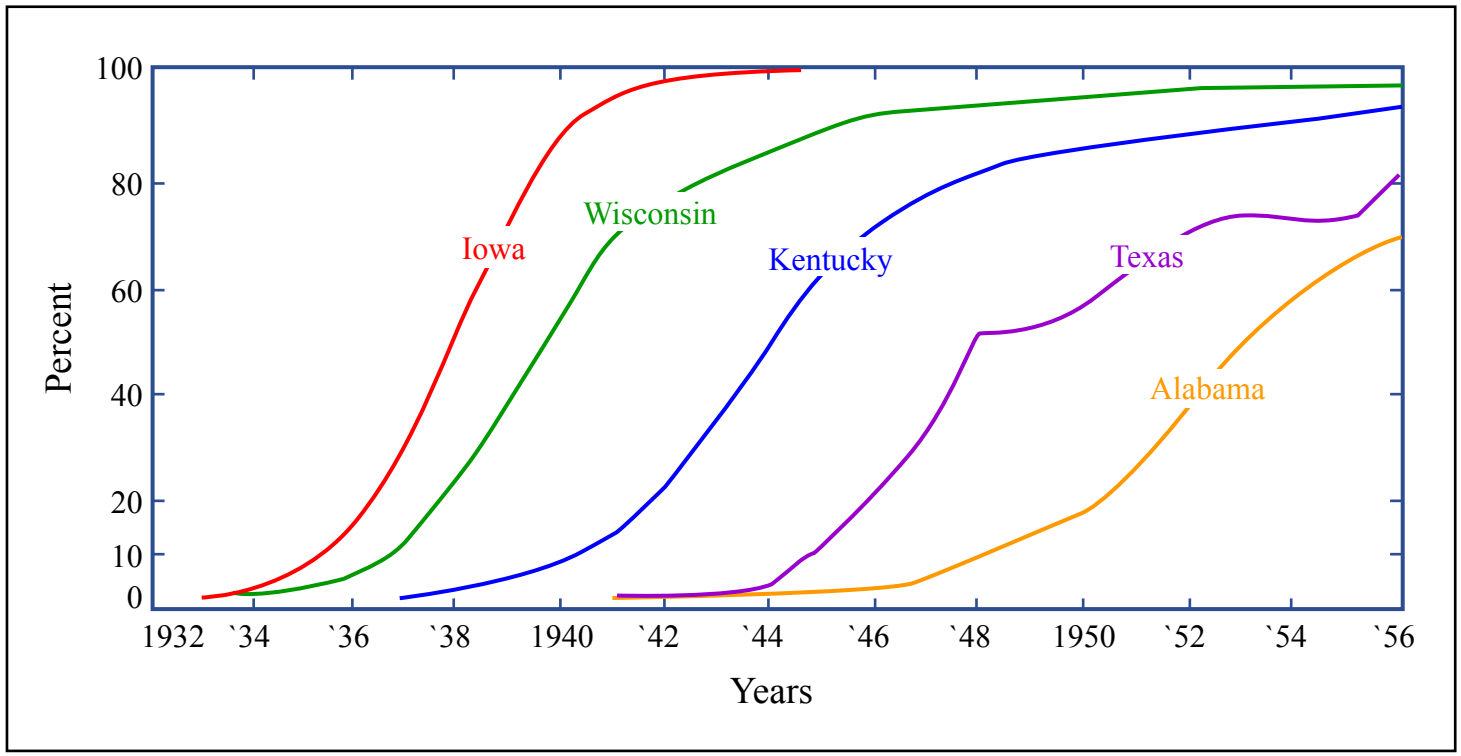


Image by MIT OpenCourseWare.

The states that tended to adopt earlier were those with the highest economic return (in terms of yields). Within each state, adoption followed an S-shaped pattern

The same basic shape and pattern is observed across a variety of technologies, such as electric motors...

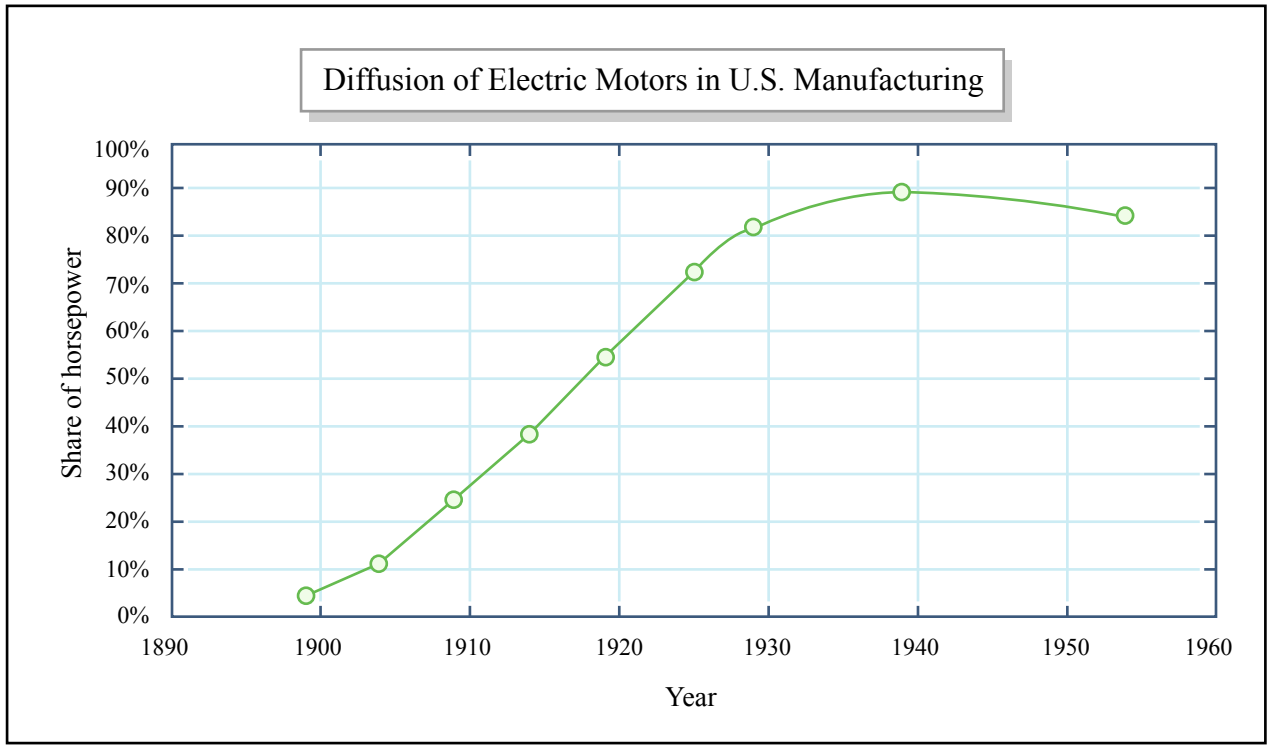
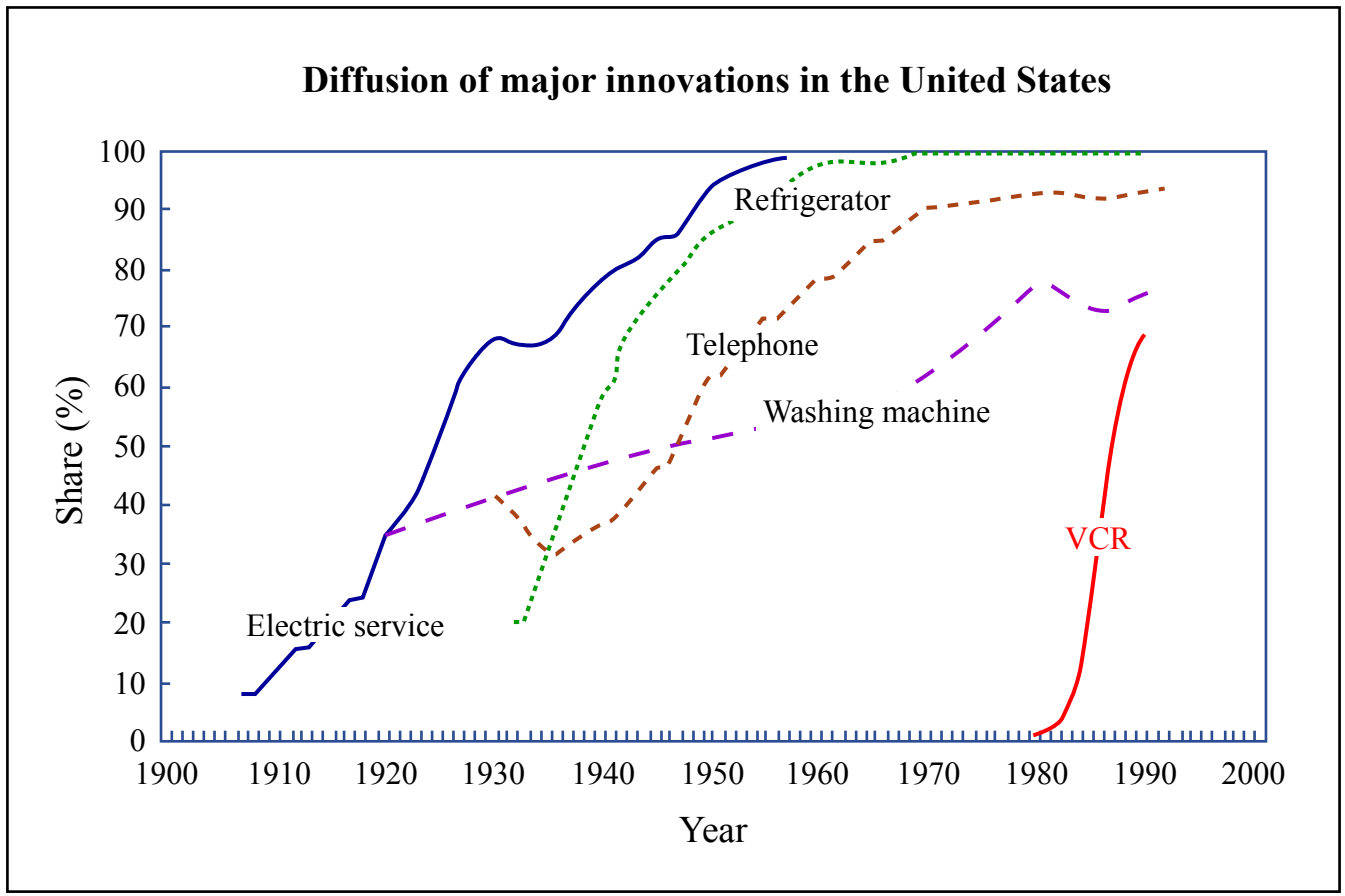


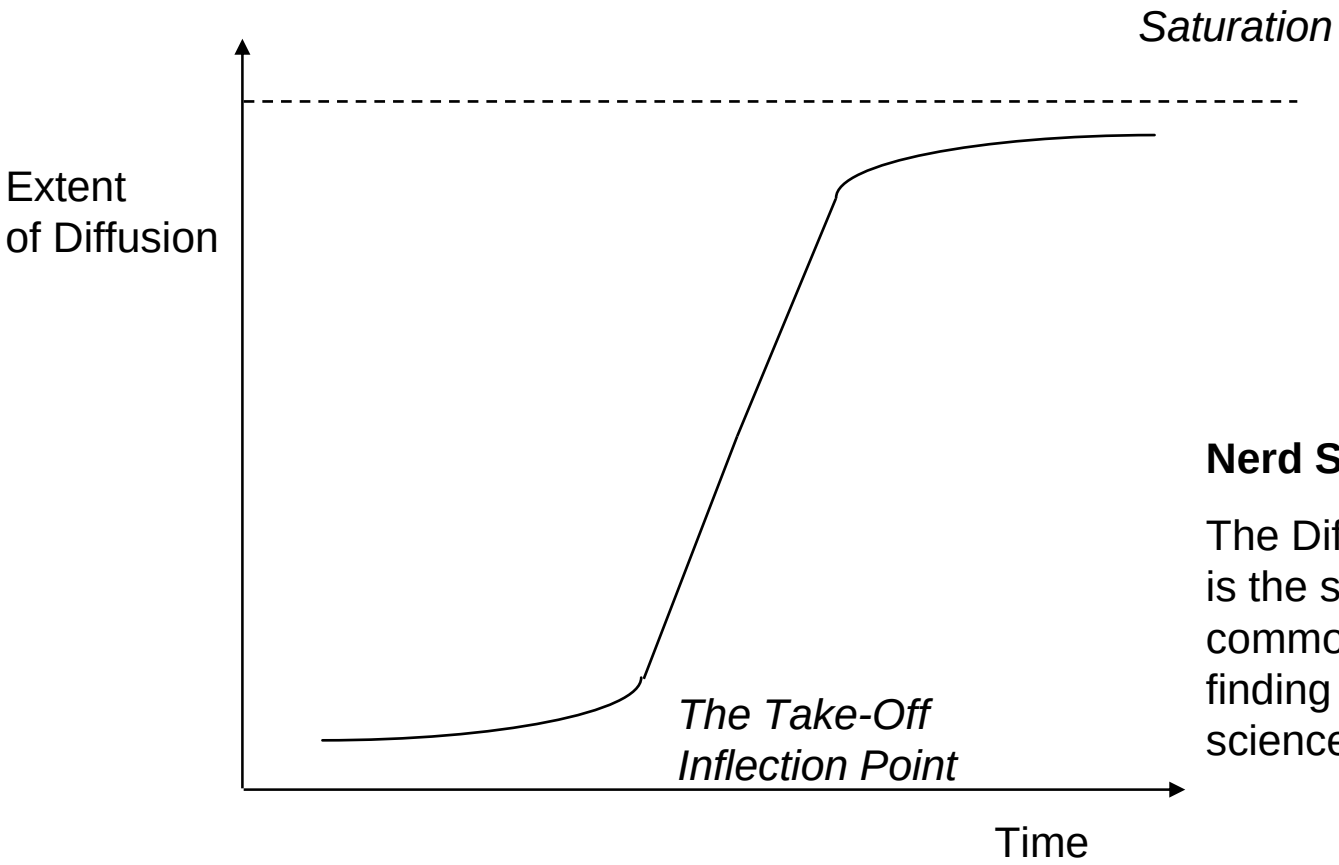
Image by MIT OpenCourseWare.

Hall, 2004

And Television, Washing Machines, VCRs, and the Internet!



Understanding market dynamics: The Market S-Curve

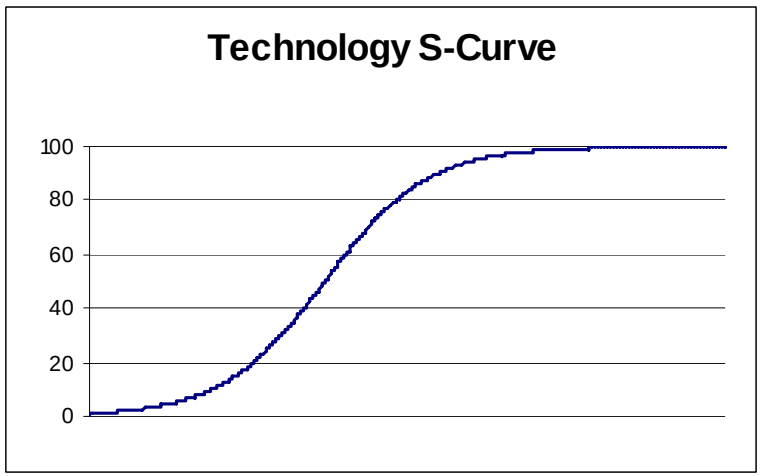


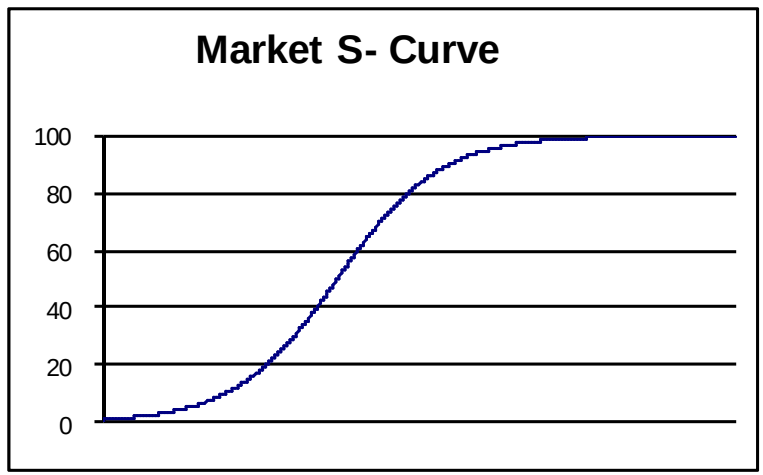
Nerd Sidebar:

The Diffusion S-curve is the single most commonly accepted finding in the social sciences

Disentangling the evolution of the technology & the market

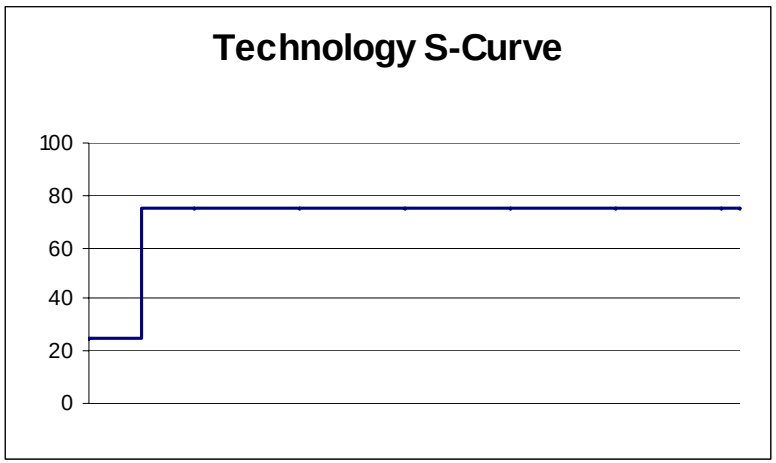
What is the relationship between these two curves? Under what circumstances do the S-Curve and the market diffusion curve look the same? *How does diffusion depend upon differences in the technology vs. differences in customers?*

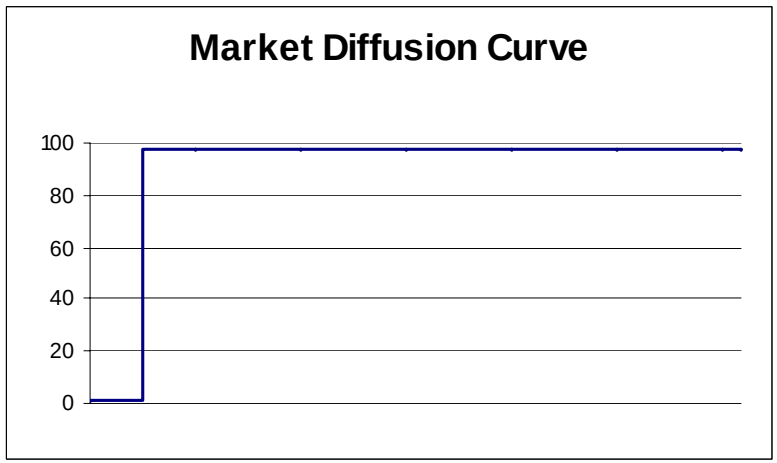




Disentangling the evolution of the technology & the market *(cont.)*

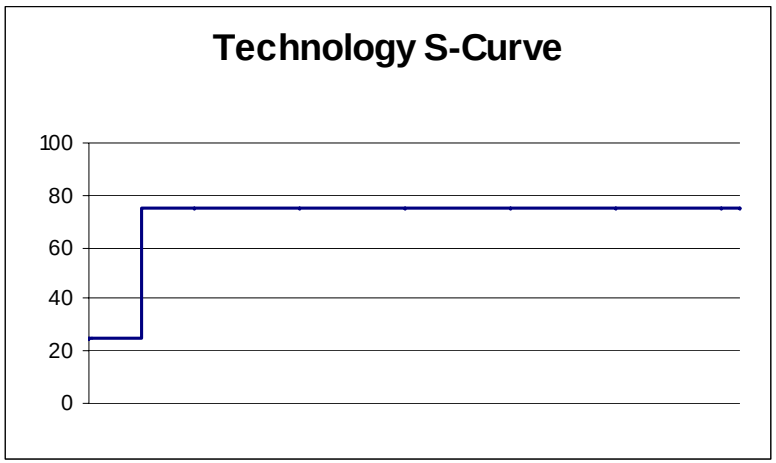
Null hypothesis.
Vaccine development for example:
technology changes ➔ immediate adoption

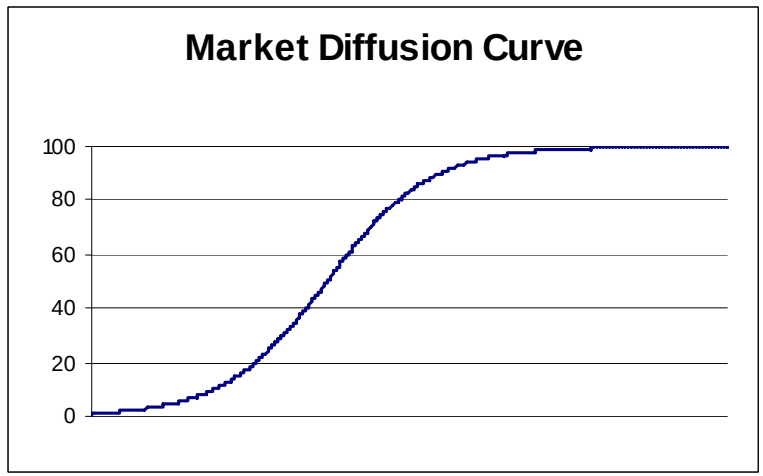




Disentangling the evolution of the technology & the market *(cont.)*

Typical situation.
Bass diffusion curve => contagion



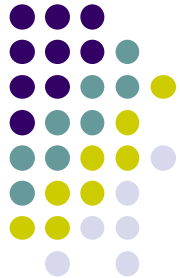


What factors can explain this kind of diffusion pattern?

Nerd Sidebar:

The Diffusion S-curve is the single most commonly accepted finding in the social sciences

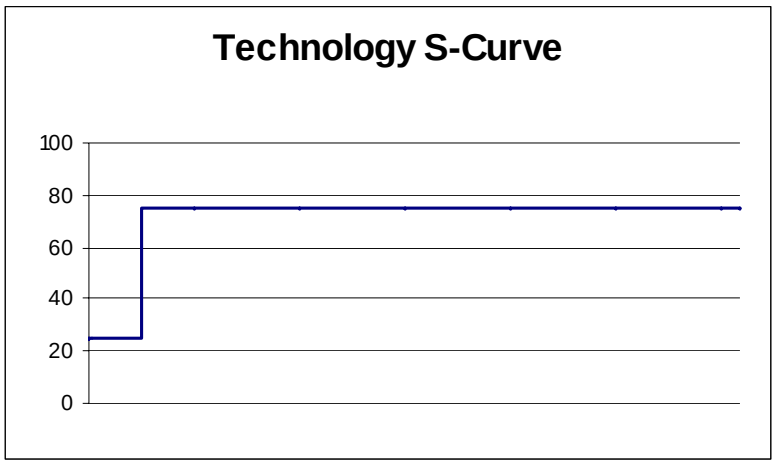
Contagion in Action:
1927 Orteig Prize & the Spirit of St. Louis

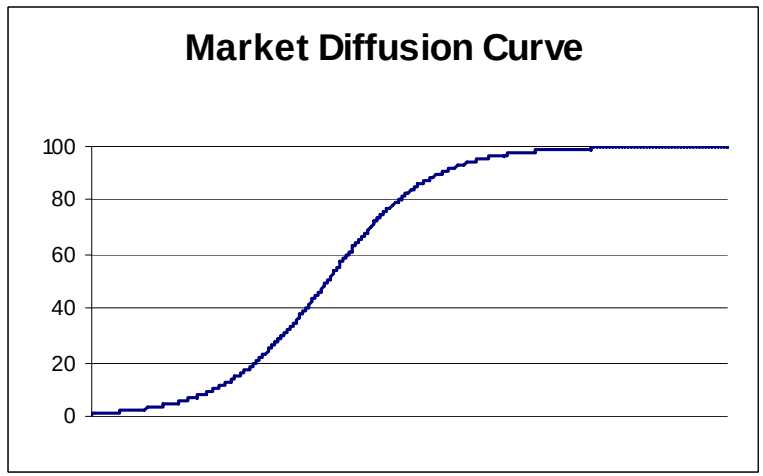


- 1919 Raymond Orteig puts up a $25,000 challenge to fly New York Paris
- 9 Teams register to compete and spent $400,000 to win the prize
- The underdog, 25 year old Charles Lindberg wins the prize!
- Within 18 months of his flight:
  - **Passenger traffic increased 30x**
  - # of aircraft increased 4x
  - Aviation stocks soar

Disentangling the evolution of the technology & the market *(cont.)*

Typical situation.
Different types of customers – Rogers on segmentation



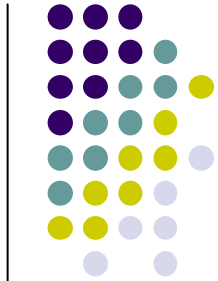


What factors can explain this kind of diffusion pattern?

Nerd Sidebar:

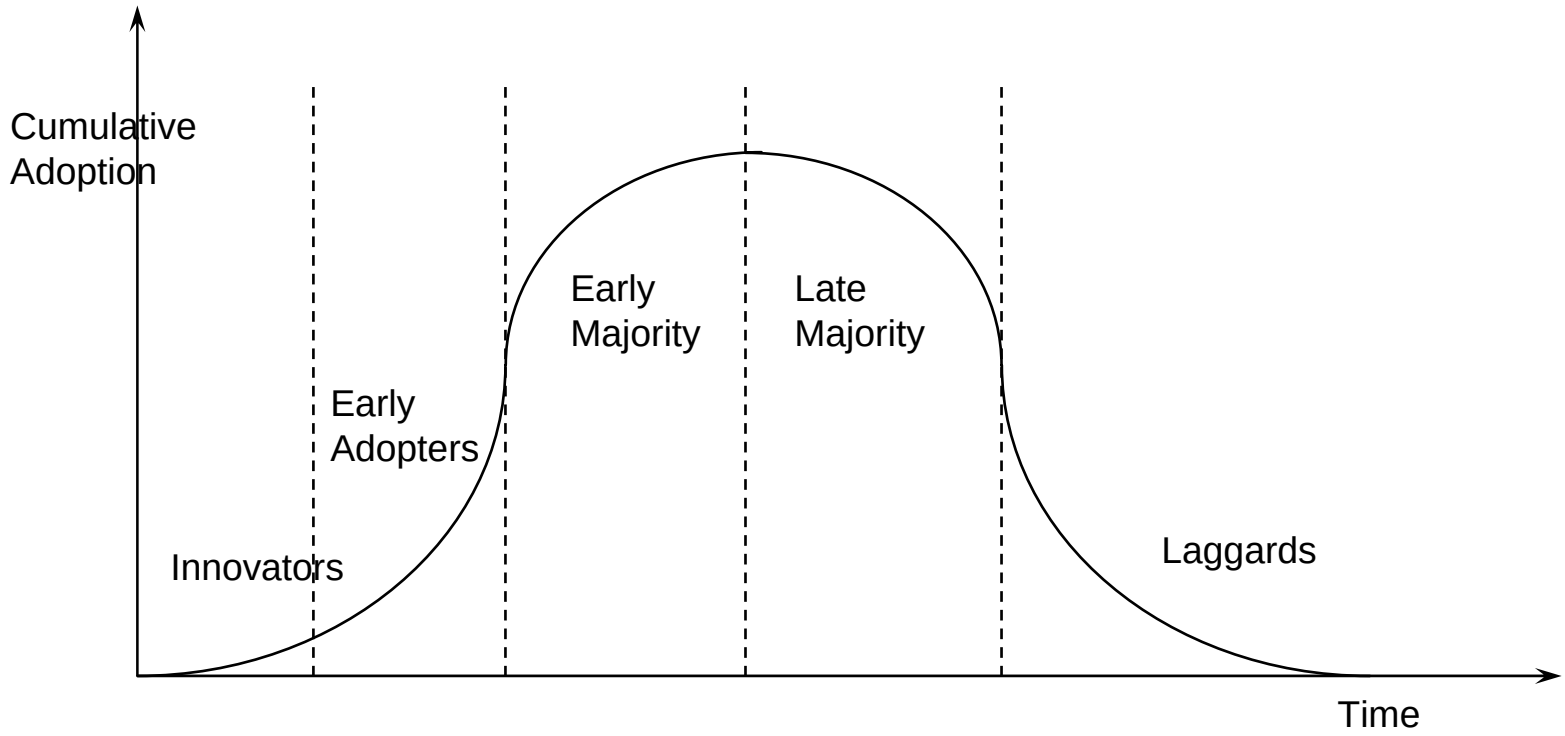
The Diffusion S-curve is the single most commonly accepted finding in the social sciences

Factors that influence diffusion:



- Progressive development of complimentary assets and complimentary products
- Classic externalities
- Word of mouth
- Process improvements
- Vintage effects (e.g. machine tools)
- Supply constraints
- Development of new uses for the same product
- General shift in the needs of the population (lifestyle effects)
- Progressive development of skills
- Pricing strategies ➔ Market diffusion curve can be the discriminatory pricing curve

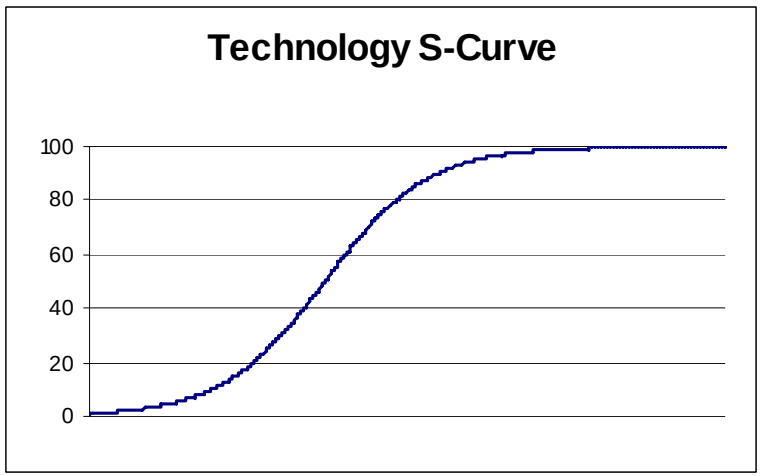
Understanding market dynamics: Basic segmentation (Rogers)

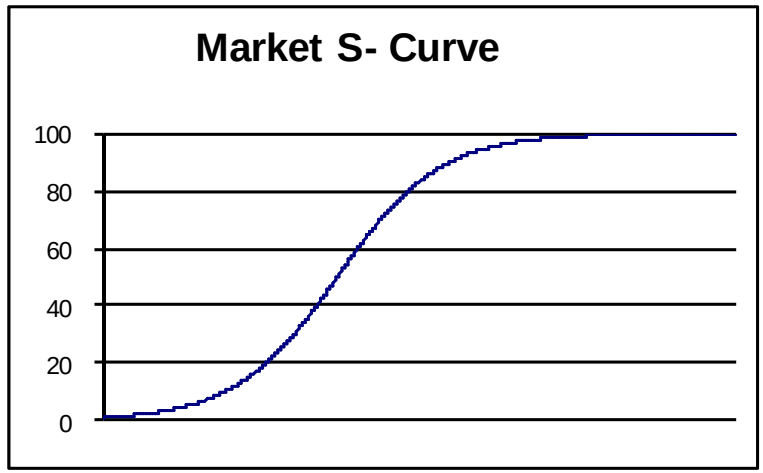


Different categories of adopters differ by, for example, social, economic status -- particularly resources, affinity for risk, knowledge, interest in the product

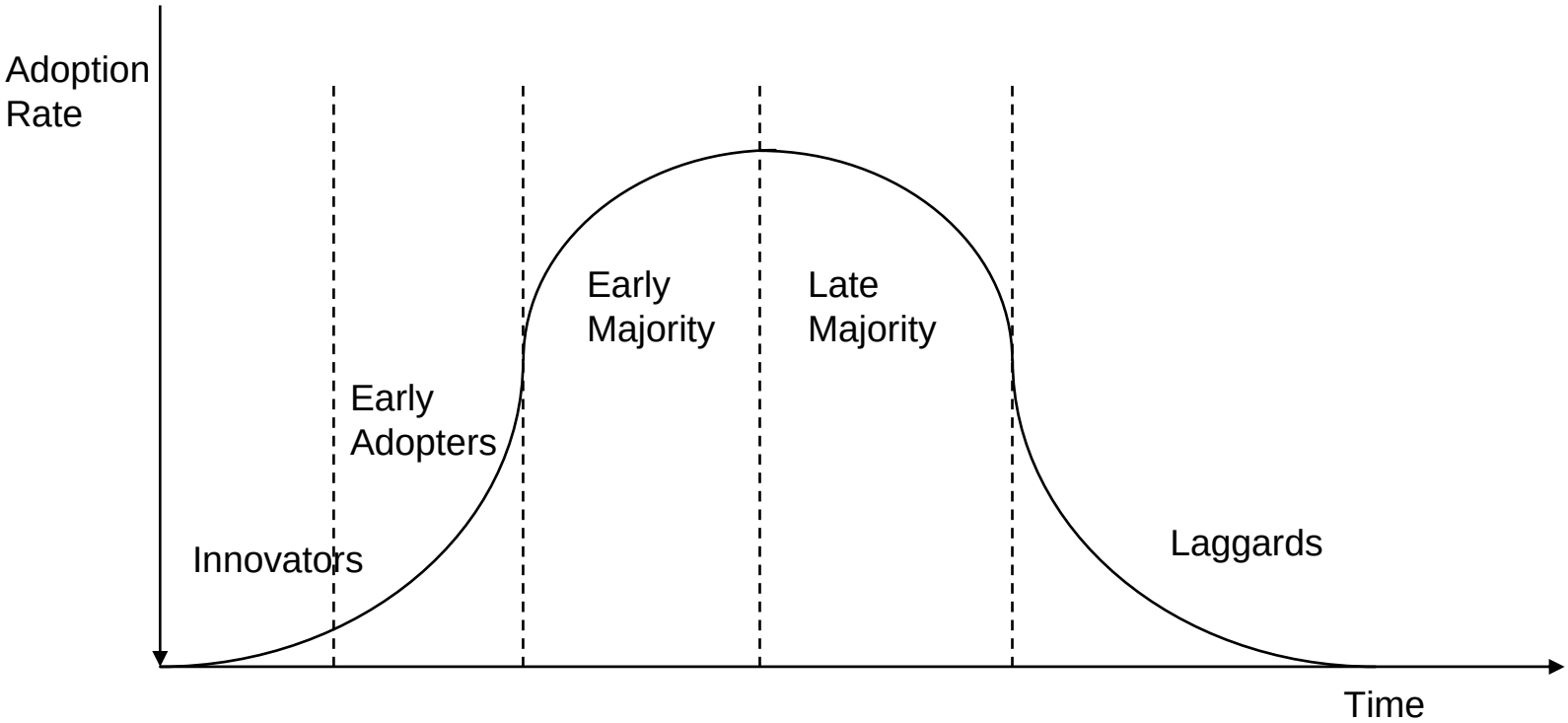
Mapping the evolution of the technology and the market (cont.)

But what if the technology is changing as well?
This scenario maps most closely to Moore although he never explicitly says so….





The Standard Market Lifecycle of Technology Adoption (Moore 1989)

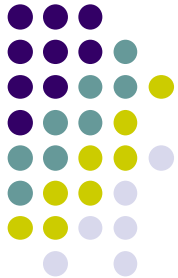


The S-Shaped Diffusion Curve Results from the existence of distinct adopter categories, who tend to purchase at a different point in the overall technology life cycle. Achieving diffusion over the life cycle depends on offering distinct value propositions to each customer grouping. The "demand curve" is changing over time!

Diffusion Patterns are the result of a *Distribution of Adopter Types*

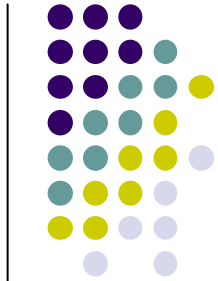
Adopter Group	Characteristics of buyers	Characteristics of tech
Innovators	Techies - Technology for technology's sake; tolerant of bugs; low ability/willingness to pay; lead users	Slow performance, bugs, no docs, gaps in functionality
Early Adopters	Visionaries - Seeking advantage through new technology; demands customization and close contact; willing to pay!	Accept tech risk, bugs & fixes, pilot project, milestones, risky; customization, PoC vs. vision
Early Majority	Pragmatists - Evolution rather than revolution; requires documentation and effective references; more cost-sensitive	Measurable & reliable technology; standardized; quality, infrastructure, support
Late Majority	Conservatives - seeking demonstrated ROI; looks for *similar references; evolution; cost sensitive*	Simple, plug & play; preassembled
Laggards	Luddites - low "WTP"; commodity technology	

Putting technology dynamics & market dynamics together



		Technology	
		Static	Changes
Customers	Same	•CONTAIGON •Information effect •WOM •Externalities • ➔ *These factors influence diffusion in al four quadrants*	• *CHANGING SHAPE OF CONTAIGON* • ➔ *Diffusion depends on the rate of technology change & its impact on customer needs*
	Different	•ROGERS •Price sensitivity •Reference information •Skills • ➔ *Diffusion depends on the number of customer segments*	•*MOORE* • ➔ *Diffusion depends both on the number of customer segments and on the rate of technology change – differentiation is key here*

Lecture wrap up



- Value is created when new technology is matched to customer need
- But customer needs change: as the technology evolves existing customers develop new needs, and in addition the technology may appeal to new kinds of customers, with new kinds of needs
- Understanding the structure of customer needs may be particularly important as it provides insight into the source of new opportunities

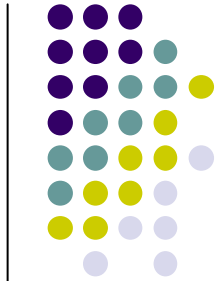
Implications

- The transition across technology & market S-Curves is a complex challenge for any organization

- At a point in time, advantage in technology-intensive industries depends on…
  - Satisfying Key Customer Segments (Exploiting the Mkt. S-Curve)
  - Organizing Around the Technology (Exploiting the Tech. S-Curve)

  => *BUT advantage over time depends on transitioning between S-Curves*

Class 3 – BIG case study



- Case: Focuses on how BIG organizes and manages its creative process to allow for repeated innovation in toys.

- Key Decision: Focus your attention on the ways in which BIG manages the creative concept development process and the idea triage process. Does this seem like the optimal process? Is this a process you are familiar with?

- Additional Assignment: watch the IDEO video (if you have not done so recently!!) and compare to BIG: http://www.ideo.com/media/nightline.asp